

Abstract Submitted
for the 1993 March Meeting
of the American Physical Society
March 22 - 26, 1993

Suggested Session Title:
Quantum Liquids and Solids

March Sorting Category:
9(c)

Design of a Low Gravity Simulator for Performing Non-Equilibrium Investigations near the Lambda Transition of $^4\text{He}^*$, U. E. Israelsson, Jet Propulsion Laboratory, California Institute of Technology, and R. V. Duncan, Sandia National Laboratories

---A design is presented of a low gravity simulator where a magnetic field gradient is employed to oppose the hydrostatic pressure effects of gravity. It appears feasible to reduce the effective gravity environment of the helium in the cell by about two orders of magnitude. The corresponding shift in transition temperature with vertical height would be reduced to 12.7 nK/cm. Methods for instrumenting the simulator to perform high resolution investigations of non-equilibrium phenomena near the lambda point are presented. The advantages of using a low gravity simulator in searching for the predicted change in character of the superfluid transition from continuous to first order in the presence of a heat current are also discussed.

*Work supported by the Microgravity Science and Applications Division of the National Aeronautics and Space Administration.

Prefer Standard Oral Session

Ulf E. Israelsson, Ph.D.
Mailstop 125-112
Jet Propulsion Laboratory,
4800 Oak Grove Drive,
Pasadena, CA 91109